Classroom-Level Differences in Child-Level Bullying Experiences: Implications for Prevention and Intervention in School Settings

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ABSTRACT ***Objective:*** Bullying occurs within children's peer groups and in classroom and school settings. Accordingly, this study aims to characterize student-level heterogeneity and change in bullying experiences by classifying students into bully/victim subgroups and to characterize how these child-level bullying experiences coalesce at the classroom and school levels. ***Method:*** A sample of 692 students in Grades 3–5 from 6 elementary schools self-reported the frequency of their involvement in bullying and victimization during the fall and spring semesters of 1 academic year. We used multilevel latent Markov modeling to identify bully/victim subgroups and classroom-level subgroup mixtures. ***Results:*** We identified 5 child-level victimization–bullying classes and 2 classroom-level mixtures, which differ in the proportions of children with few or no experiences of victimization or bullying and children who reported high levels of victimization. The proportion of classroom-level mixtures differed significantly across sampled schools, suggesting that classroom bullying climate may be partly a function of school-level phenomena. ***Conclusions:*** Classroom-level differences indicate a need for unique prevention and intervention approaches. Targeted classroom interventions may be useful for influencing students moderately involved in bullying to transition into an uninvolved state, but more intensive, individualized interventions may be needed for students who are highly involved in bullying behaviors.

KEYWORDS: bullying, peer victimization, classroom ecologies, school climate, multilevel modeling

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Bullying is commonly viewed as a social–ecological phenomenon (see Espelage & Swearer, 2011) that occurs within children's peer groups and in classroom and school settings. As such, bullying is not a dyadic event but rather the result of interactions between students who hold differing power and status positions within the peer group (Olweus, 1993; Volk, Dane, & Marini, 2014). Consequently, bullying is

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considered a peer-group phenomenon where children occupy different roles, including children who bully (*bullies*), children who are targeted (*victims*), children who bully but are also targeted (*bully-victims*), and those who are not involved (*bystanders*; see Salmivalli, Lagerspetz, Bjorkqvist, Osterman, & Kaukiainen, 1996). Bullying incidents also occur within classroom and school ecologies that may differ in the degree to which bullying behavior is tolerated (Williford, 2015). For example, classroom ecologies may largely depend on the composition of students (i.e., bully/victim subgroups) and on teacher (e.g., attitudes) and classroom (e.g., size) characteristics. It follows, then, that bully/victim subgroups may be a key component of the composition of students in the classroom ecology and can influence student and group-level phenomena. In fact, in classrooms with a greater number of children who bully, poorer classroom climate (Yoneyama & Rigby, 2006) and lower school performance (Juvonen, Wang, & Espinoza, 2011) often result. Thus, examining the composition of bully/victim subgroups may provide meaningful insights into the overall classroom ecology.

Moreover, given evidence suggesting the powerful role of teachers—especially in elementary school settings (see Gest & Rodkin, 2011)—investigating how these bully/victim subgroups coalesce at the classroom level may advance understanding of the classroom environment and thus inform effective practices to reduce bullying incidents within this ecological setting. Additionally, involvement in bullying—as a perpetrator, victim, or bystander—is not considered a static event but rather a phenomenon that changes over time (e.g., Ryoo, Wang, & Swearer, 2015), where individual and ecological characteristics may exacerbate or hinder such involvement. However, there are few studies of how students cluster into bully/victim subgroups at both the individual and classroom levels and how these clusters may change over time. To that end, the present study examined the classroom- and school-level heterogeneity of students' bullying experiences using an application of latent transition analysis within a multilevel framework.

Understanding Bullying as a Social–Ecological Phenomenon

Bullying is defined as repeated, intentional negative actions by one or more students, including both overt and relational behaviors aimed at exerting real or perceived power over victims who struggle to defend themselves (Olweus, 1993; Volk et al., 2014). Overt bullying includes hurtful name-calling, hitting, kicking, pushing, or the expression of physical intimidation and threats (Little, Henrich, Jones, & Hawley, 2003; Olweus, 1993). Relational bullying manipulates relationships to inflict harm on others by gossiping, breaking confidences, spreading rumors, and ostracizing or excluding others (Crick & Grotpeter, 1995). Bullying involvement is relatively stable across childhood and adolescence with evidence suggesting that approximately 20%–30% of youth are involved as perpetrators, victims, or both (Ar-

seneault et al., 2006; Nansel et al., 2001; Wolke, Woods, Stanford, & Schulz, 2001). Rates of peer victimization among younger students may even be higher, with recent studies suggesting that over 60% of children report at least some exposure during elementary school (Cooley, Fite, & Pederson, 2017; Ladd, Ettekal, & Kochenderfer-Ladd, 2017). Thus, bullying and peer victimization are considered salient behaviors for elementary school children.

Involvement in overt and relational bullying has been shown to negatively affect children's development. For example, victims of bullying often experience increased loneliness, depressive and anxiety symptoms, peer rejection, and poorer school adjustment and academic performance as compared to nonvictimized youth (Marini, Danes, Bosacki, & YLC-CURA, 2006; Schwartz, Gorman, Nakamoto, & Toblin, 2005). Despite evidence suggesting that children who engage in bullying may benefit from their behavior by gaining power and status among their peers (e.g., Hawley, 2003), research has also found that bullies—especially those engaging in overt forms—are at an increased risk for participating in more serious forms of delinquency and often express lower levels of empathy and school commitment than their peers who do not bully (Bender & Lösel, 2011; Cunningham, 2007; Jolliffe & Farrington, 2006; Williford et al., 2016).

Consistent with Bronfenbrenner's (1979) bioecological theory of human development, bullying is characterized as a behavior that occurs within the context of certain ecological settings, such as the peer group and school or classroom environments. It is theorized that bullying behaviors are more likely in peer, classroom, and school ecologies where probullying norms exist (Olweus, 1993; Rodkin, 2004). As such, bullying is not considered an event that occurs in isolation between a bully and a victim; rather, bullying occurs in the presence of peers who may be supportive of or unresponsive to bullying (e.g., bystanders) and in classroom and school ecologies that may differ in the degree to which bullying behavior is tolerated (see Hawley & Williford, 2015).

Central to Bronfenbrenner's theory is a focus on proximal processes. According to Bronfenbrenner (1999, p. 5), "human development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment." Bronfenbrenner (1989) also argues that these interactions must occur regularly over an extended time period to impact the development of both the person and their environment. The concept of reciprocal influence between individual and environmental characteristics has played a key role in understanding the development and maintenance of bullying behavior over time. As such, bullying is viewed as an ecological phenomenon that occurs within a social context over time and is influenced by both the characteristics of the individual and the environment where the bullying takes place (Cook, Williams, Guerra, Kim, & Sadek, 2010; Espelage & Swearer, 2011).

Classroom Influences on Students' Bullying Involvement

Especially in elementary school settings, the classroom is an important ecology for understanding students' involvement in bullying. In elementary school, students are often in one classroom with a group of peers and one teacher throughout the school day; thus, children's social networks present within a classroom are an important aspect of the classroom's ecology (see Rodkin & Gest, 2011). It follows that the composition of bully/victim subgroups (i.e., participant roles) within an elementary school classroom may influence classroom climate. Evidence suggests that children are influenced by their peer experiences as well as by the social networks and group norms that structure the classroom environment (Bierman, 2011; Kindermann & Gest, 2009), which in turn influence the classroom climate.

These social networks are one of the "structural features and dynamics of the peer ecology" that Rodkin and Gest (2011, p. 77) suggest should be considered when understanding bullying involvement among students. Factors such as status hierarchies and group norms among students represent mechanisms that structure students' social networks in the classroom. For example, classrooms that are more stratified by students' social status, and thus are less egalitarian, often favor group norms that support bullying and aggression and the resulting peer rejection faced by victims (Rodkin & Gest, 2011). Moreover, in classrooms where bullying and aggression are considered normative, higher rates of bullying and aggression exist, and children in these classrooms tend to become more aggressive over time (Rodkin & Gest, 2011). Therefore, a cyclical relationship appears to exist: Bullying and aggression support highly stratified status hierarchies that then reinforce group norms favoring these behaviors and allow them to persist, if not worsen over time. Thus, classrooms where more bullies and victims exist may represent these more highly stratified status hierarchies and norms favoring bullying and may contribute to the maintenance of these behaviors over time.

Evidence also suggests that, although teachers are not a part of the peer ecology, they play a role in structuring interactions and relationships among children in their classroom (Farmer, Lines, & Hamm, 2011; Gest & Rodkin, 2011). Specifically, teachers and peers are thought to influence behavioral outcomes for children in two ways. First, students directly interact with teachers and peers, which in turn results in classroom experiences that influence their "social preference (being accepted or rejected by peers), social integration (degree of social network integration or isolation), social dominance (degree of prominence and influence vs. submission, exposure to victimization), reciprocated friendships, and social reputation" (Bierman, 2011, p. 298). Second, students are influenced by the classroom level via certain characteristics, such as peer social networks, group norms that may favor bullying, and the knowledge, attitudes, and actions of teachers (Bierman, 2011; Gest & Rodkin, 2011). Of note, evidence suggests that when teachers do not understand the student social networks in their classrooms, bullying behavior may be exacerbated

(Rodkin & Gest, 2011). Accordingly, assessing peer relations, including students' bullying involvement, requires examining both the individual student (e.g., peer group ecology) and classroom (e.g., classroom ecology) levels. One approach for doing so is to identify students' roles within the complex social–ecological phenomenon of bullying at the individual student level and at the classroom level.

Understanding Bullying Involvement Over Time

Given the understanding of bullying as a phenomenon in which children occupy distinct roles, a number of scholars have used person-centered approaches—techniques such as latent class analysis (LCA) and latent transition analysis (LTA)—to understand the nature and distribution of these roles. Although several methodological approaches have been used to investigate bullying, person-centered methods are useful for understanding bullying roles because they can identify distinct subpopulations (i.e., participants' roles) based on patterns of involvement across different indicator variables. Thus, these techniques reveal the heterogeneity in children's experiences, which is thought to provide more accurate reflections of student participation in and exposure to bullying (see Nylund, Bellmore, Nishina, & Graham, 2007). Consistent with Bronfenbrenner's (1979, 1989, 1999) assertions regarding human development within the context of certain ecological settings, person-centered approaches are appropriate for understanding the nature and distribution of bully/victim subgroups at the classroom level over time. Specifically, these techniques capture the composition of students in the classroom ecology over time, providing a mechanism for understanding the complex interactions between individuals and their environment.

Several investigators have employed LCA or LTA to examine bully/victim subgroup membership. For example, in a study examining peer victimization only (Nylund et al., 2007), results revealed that a three-class solution—victimized, sometimes victimized, and nonvictimized classes—best fit the data for students in sixth to eighth grades. This study also found that the degree of exposure to victimization differentiated these classes, rather than the type or form of victimization. In an additional study of middle school youth, Giang and Graham (2008) employed LCA and found that a five-class solution best fit the data, with a "socially adjusted class" (e.g., uninvolved students), a victimized class, an aggressor class, and two aggressive-victim classes (highly victimized aggressive-victims and highly aggressive aggressive-victims). These findings follow the more traditional classes theorized to represent bullying involvement with the addition of two aggressive-victim classes. Again, in this study the form of the behavior did not influence the classification of students into bully/victim subgroups.

Other studies, however, have found that the form of the behavior influences class membership. For example, Goldweber, Waasdorp, and Bradshaw (2013) found a four-class solution in a middle school sample (low involvement, verbal, high physical/

high verbal, and high involvement) and a three-class solution in a high school sample (low involvement, verbal, and high involvement), indicating that verbal and physical behaviors further differentiated these subgroups. Another study (Bradshaw, Waasdorp, & O'Brennan, 2013) among middle and high school students examined peer victimization only and found a four-class solution in middle school (verbal/physical, verbal/relational, high verbal/physical/relational, and low victimization/normative) and a three-class solution for high school students (verbal/relational, high verbal/physical/ relational, and low victimization/normative). Again, these findings suggest that the form of the behavior may be an important factor for understanding the composition of bully/victim subgroups.

Few studies, however, have investigated bully/victim subgroup membership over time. In one recent exception, Ryoo et al. (2015) estimated separate LTA models for bullying and peer victimization among students in Grades 5–9 across three time points. They found four classes for victimization (frequent victim, occasional victim, occasional cyber/traditional victim, and infrequent victim) and three classes for bullying (frequent perpetrator, occasional verbal/relational perpetrator, and frequent perpetrator). Results also revealed that infrequent classes for both bullying behavior and peer victimization were most stable across the three time points, whereas frequent victim and perpetrator classes were the least stable over time. In one of the few studies of elementary school students, Williford, Brisson, Bender, Jenson, and Forrest-Bank (2011) used LCA to classify students into bully/victim subgroups and then used cross tabulations to examine changes in group membership from fourth to sixth grade. Results supported a four-class solution in fourth grade that represented the theoretically expected classes of aggressor, victim, aggressor-victim, and uninvolved. However, a three-class solution best fit the data in fifth and sixth grades, with a victim, victim-aggressor, and uninvolved class; thus, the aggressor-only class disappeared by fifth grade. Cross tabulations suggested that group membership changed significantly across these three grade levels, with most youth participating in episodes of aggression and victimization by the time they reached sixth grade, corresponding to a transition to middle school for most sample participants.

In sum, results from these LCA and LTA models indicate that person-centered approaches are appropriate for investigating the heterogeneity in youth bullying experiences (see Nylund et al., 2007). However, the findings from these studies are somewhat mixed in terms of whether the frequency of involvement or the form of the behavior further differentiate bully/victim subgroups, with some evidence suggesting that frequency and form may matter and others finding no such distinctions. Of note, few investigations have included elementary school youth despite the salience of these behaviors during this developmental time period. Additionally, little is known about how these subgroups manifest at the classroom level and may represent influential social networks that structure the classroom environment. Accordingly, the present study extends bullying literature in several mean-

ingful ways by focusing on a sample of elementary school students in Grades 3–5, using a person-centered approach to capture the heterogeneity of bullying involvement over time, and incorporating a multilevel modeling framework to examine bullying at the classroom level.

Purpose of the Present Study

The present study examined classroom- and school-level heterogeneity of students' bullying experiences using multilevel latent Markov modeling (Vermunt, 2010). We pursued two related objectives. The first objective was to characterize student-level heterogeneity in bullying experiences and change in bullying experiences over the academic year by classifying students into bully/victim subgroups. Based on prior work, we hypothesized that subgroups would represent the theoretically anticipated groups based on participant roles in bullying: bullies, victims, bully-victims, and uninvolved students. We expected that both the frequency of involvement and the form of the behavior may influence the classification of students into bully/victim subgroups. We also hypothesized that students would transition between these bullying subgroups over the course of the academic year, consistent with limited prior evidence indicating episodic involvement among elementary school youth (Williford et al., 2011). Our second objective was to characterize how these child-level bullying experiences coalesce at the classroom and school levels. As prior evidence suggests that differences exist in classroom structure and classroom and school characteristics (see Rodkin & Gest, 2011), we hypothesized that different constellations of these subgroups might emerge representing distinct classroom level profiles. However, no specific predictions were made given the lack of evidence of these profiles at the classroom level and the exploratory nature of this analysis.

Method

Sample Characteristics

Data for the present study stem from a larger bullying project that included student survey data collection as well as both qualitative (e.g., interviews with principals, focus groups with teachers and counselors/social workers; see Huber-Smith & Williford, 2014) and quantitative (e.g., certified and noncertified staff surveys; see Williford, 2015; Williford & DePaolis, 2016) data collection with school personnel in six elementary schools during the 2013–2014 academic year. The schools were located in a large suburb in the Midwestern United States. The sampling frame for this study included children enrolled in the third, fourth, or fifth grade in these six schools. After receiving human subjects approval from the sponsoring university and school district, all students in these grades were recruited to participate in the study through parent/teacher conferences at the beginning of the fall semester. Teachers provided the consent form and a brief study description to parents/guard-

ians during these conferences. Children whose parents/guardians provided consent for their child's participation during these conferences or returned the consent form to the principal after the conferences were included in the study. Parental consent rates varied from 47% to 72% with an average consent rate of 58%; student assent rates were 100% across the schools. Data were collected using in-class online surveys that were administered in the school's computer lab twice during the school year: once during the fall semester (October–November 2013) and once during the spring semester (April–May 2014). To ensure that students understood each question, the principal investigator or trained graduate research assistants read all questions aloud to students. Study protocols met all ethical standards as required by the sponsoring institutional review boards of the university and school district.

The final analytic sample was limited to students who had responded to the survey questions about bullying behaviors. This subsample consisted of 449 students (93.8% of survey completions) in 52 classrooms across six elementary schools. A breakdown of the number of participating students and classrooms per school is provided in Table 1. Overall, the sample was 51.3% female, with a mean age of 9.4 years ($SD = 1.3$). A total of 248 students were third graders (35.8%), 194 were fourth graders (28.0%), and 250 were fifth graders (36.1%). Although race/ethnicity and socioeconomic data were not available for the study sample, the student population across the participating schools is 6% African American, 17% Hispanic, 68% non-Hispanic White, 8% other, and 32% economically disadvantaged (defined as free and reduced lunch eligibility).

Measure

The Peer Experiences Questionnaire was used to measure students' self-reports of involvement in bullying and victimization. This scale has previously been used with

Table 1
Number of Classrooms and Students by School

	Classrooms		Students	
School	*n*	%	*n*	%
A	5	9.6%	76	11.0%
B	11	21.2%	153	22.1%
C	9	17.3%	133	19.2%
D	6	11.5%	90	13.0%
E	12	23.1%	131	18.9%
F	9	17.3%	109	15.8%
Total	52	–	692	–

elementary school samples and found to be a reliable and valid measure of bullying involvement (e.g., Vernberg, Nelson, Fonagy, & Twemlow, 2011). The following definition of bullying was provided to study participants prior to responding to the questionnaire: "We define bullying as (1) negative actions intended to harm or injure another person, (2) taking place over time, and (3) someone more powerful picking on someone who is less powerful." The victimization scale included 11 items: Four items assessed relational victimization (e.g., "A kid ignored me on purpose to hurt my feelings" and "A kid started a rumor that I had a crush on another kid"), and seven items assessed overt victimization (e.g., "A kid hit, kicked, or pushed me in a mean way" and "A kid said he or she was going to hurt me or beat me up"). An identical 11-item scale assessed relational bullying (e.g., "I ignored someone on purpose to hurt his or her feelings") and overt bullying (e.g., "I hit, kicked, or pushed someone in a mean way"). Participants were prompted to report the frequency at which these experiences occurred over the past 30 days, responding to a 5-point Likert scale ranging from *never* to *a few times a week*. Cronbach's alphas for the victimization and bullying scales were .885 and .830, respectively.

Analysis Approach

To examine how student-level bullying experiences coalesced at the classroom level, we estimated a series of multilevel latent Markov models (Vermunt, 2010). In brief, a latent Markov model (also known as a latent transition model) is a longitudinal version of latent class models in which the correlation within students across measurement occasions is modeled as a first-order autocorrelation. As is the case with LCA, latent Markov models can identify a discrete number of student-level states based on a set of observed (or manifest) variables. These states can differ with respect to the distribution of manifest variables and the probability of transitioning from one state to another over time. The multilevel version of the latent Markov model that is used here allows us to identify unique classroom-level mixtures (i.e., classes) of student-level states. These classes can vary with respect to the relative proportions of student-level states and probabilities of transitioning between states. Analogous to a standard latent Markov model, the multilevel latent Markov model yields subject-level posterior probabilities of assignment to each student-level state and classroom-level class.

We estimated the latent Markov models using ordinal-level transformations of each of bullying subscale. Specifically, discrete, five-level ordinal variables were created for each subscale using the following intervals: score = 0, 0 < score < .5, .5 < score < 1, 1 < score < 2, 2 < score. The three highest categories were collapsed for the two bullying subscales because the proportion of students scoring higher than 1 was small (8.4%). Further, because prior work has suggested that bullying experiences are strongly related to gender and grade level, both variables were included as predictors in the latent Markov models. Thus, the resulting student-level

states and classroom-level classes are based on the conditional distributions of the transformed bullying subscales. Because the school sample size ($N = 6$) was too small to model schools, we examined the school-level distribution of student-level states and classroom-level classes using posterior probabilities from the latent Markov model and a bias-corrected three-step approach developed by Bolck, Croon, and Hagenaars (2004), and by Vermunt (2010).

Findings

Descriptive Findings

Across both survey waves, the mean scores on the victim-relational and overt subscales were 0.66 and 0.39, respectively, corresponding to values between *never* (0) and *once or twice* (1). The mean scores on the bullying subscales (relational = 0.14, overt = 0.09) were considerably smaller. The medians on all four subscale scores (victim-relational = 0.5, victim-overt = 0.2, bullying-relational = 0.0, bullying-overt = 0.0) were less than the mean scores, reflecting an upward skew in their distributions. Also, the interquartile range for the bullying subscales (relational = 0.83, overt = 0.60) were generally much narrower than those for the victim subscales (relational = 0.17, overt = 0.00). Finally, there were no statistically significant differences in mean bullying subscale scores across measurement occasions (i.e., school semesters).

Multilevel Latent Markov Models

Model selection. Model identification proceeded in several steps. First, we estimated a series of student-level latent Markov models. Based on a combination of statistical fit indices—Bayesian information criterion, Akaike information criterion, bivariate residuals, and classification error—group size, and the uniqueness of state-specific manifest variable distributions, a five-state model was selected. Second, we estimated a set of models with varying numbers of classroom-level classes in which the between-state transition probabilities were constrained to be equal across classes. Based on the same criteria used to identify the student-level-only model, a two-class, five-state model was selected. (To avoid confusion, in the remainder of the paper we will refer to student-level states as *profiles* and classroom-level classes as *mixtures*.) Finally, we tested whether any of the between-profile transition probabilities should be allowed to vary across classroom-level mixtures. Based on the relative statistical fit, we retained the model in which the between-profile transition probabilities were constrained to be equal across mixtures.

Student-level profiles. The standardized mean bullying subscale scores for students who were assigned to each of the student-level bullying profiles are plotted in Figure 1. As hypothesized, these profiles represented the theoretically expected subgroups but were further differentiated by frequency and to some degree by

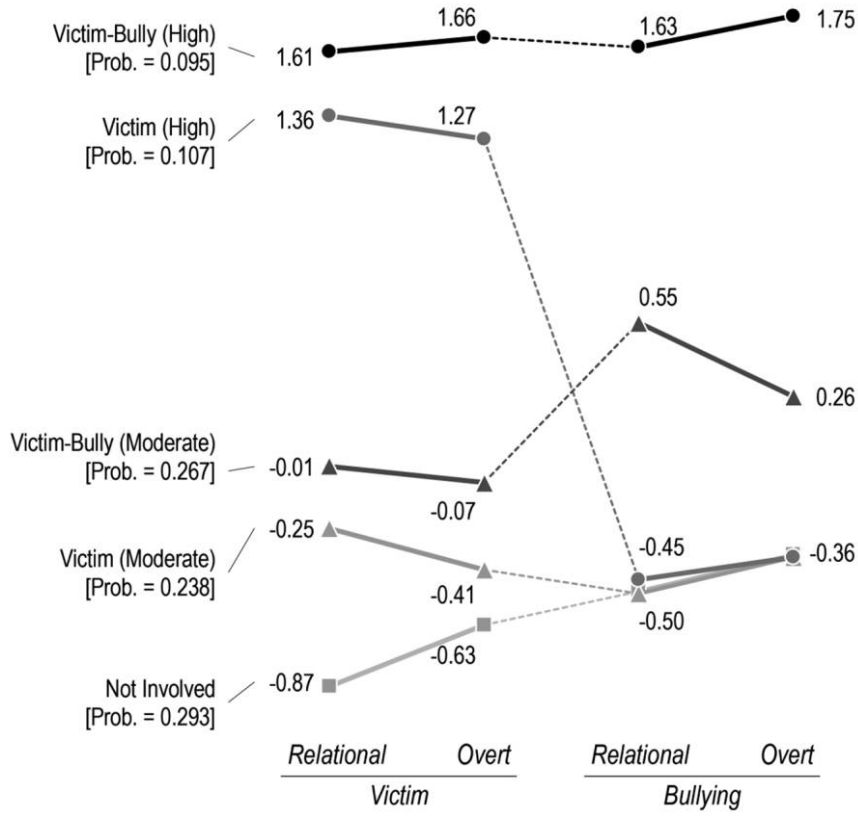

Figure 1. Standardized mean bullying subscale scores by student-level bullying states. Prob. = probability.

form. The three most prevalent student-level bullying profiles consisted of students with relatively lower bullying scale scores. The first of these—*not involved* (probability = 0.293)—had the lowest mean victim scores and shared the lowest bullying subscale scores with two other profiles. The second profile—*victim (moderate)*—had a probability of 0.238 and statistically significant higher mean victim scores than the *not involved* profile but had statistically equivalent scores on both of the bullying subscales. The third profile—*victim-bully (moderate)*—had a probability of 0.267 and statistically significantly higher victim scale scores; the third profile also had substantially higher bullying scale scores than the *not involved* and *victim (moderate)* profiles. The two remaining profiles consisted of students with relatively high bullying scale scores. The first of these—*victim-bully (high)*—had a probability of 0.095 and had statistically significantly higher scale scores than any other profile. The final profile—*victim-bully (moderate)*—had a probability of 0.107 and also had relatively high victim scale scores. However, the mean bullying scale scores for this profile were as low as those observed for the *victim (moderate)* and *not involved* profiles.

Between-profile transition probabilities. The predicted probabilities for transitions among the student-level profiles over the academic year are plotted in Figure 2.

Collectively, the joint probability of transitioning to a different profile (0.302) was substantial (right panel of Figure 2), consistent with the study's hypothesis regarding changes over the academic year. However, this probability varied considerably across profiles. For example, among students belonging to the *not involved* profile in the fall semester, only 1 in 10 transitioned to a different profile, with almost all students transitioning to the *victim-bully (moderate)* profile. Alternatively, students in the *victim-bully (high)* and *victim (high)* profiles had the highest rates of transition to different profiles: *victim-bully (high)* transition probability = 0.471; *victim (high)* transition probability = 0.436. For both of these profiles, students appear

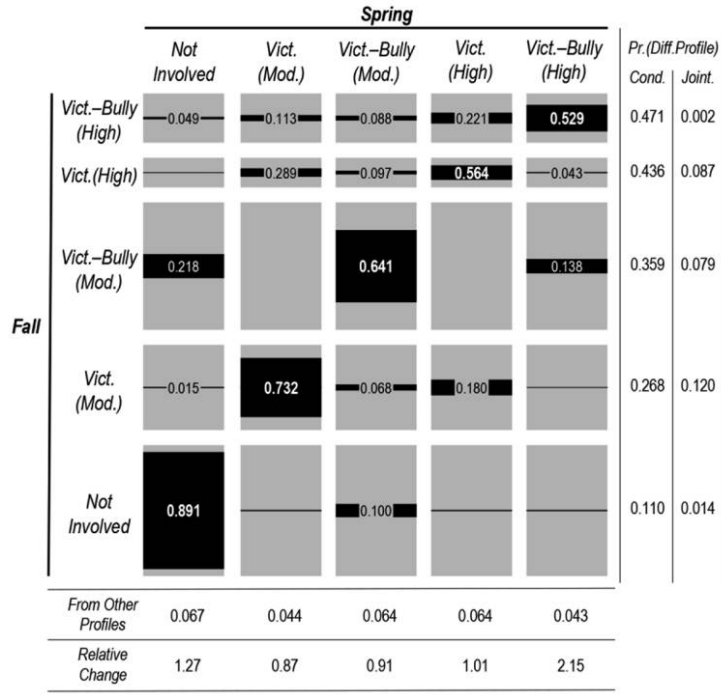

Figure 2. Multilevel latent Markov model student-level transition probabilities. Row heights have been scaled to reflect the distribution of profiles during the fall semester. The height of the black bars (relative to the height of their respective rows) represent the conditional probabilities of having transitioned to different profiles. The probabilities on the diagonal represent the proportion of students who remained in the same profile between fall and spring semesters. The probabilities listed in the right panel represent the conditional and joint probabilities of having transitioned to a different student-level profile. The probabilities listed in the bottom panel represent the unconditional probabilities of having transitioned to a specific profile from any of the other profiles. Where transition probabilities are not shown, the probability is < 1%. Vict. = victim; Mod. = moderate; Pr. = probability; Diff. = difference; Cond. = conditional.

to have transitioned to several different profile types, with somewhat larger proportions transitioning to contiguous profiles. For example, 22.1% of students in the *victim-bully (high)* profile transitioned to the *victim (high)* profile. Similarly, 28.9% of students in the *victim (high)* profile transitioned to the *victim (moderate)* profile. In contrast, among students in the *victim-bully (moderate)* profile who transitioned to different profiles (probability = 0.379), 21.8% and 13.8% transitioned, respectively, to the *not involved* and *victim-bully (high)* profiles, evidencing more substantive shifts in bullying experiences. Finally, the predicted sample proportions transitioning to each profile type were approximately equal, ranging from 0.043 to 0.067. However, the relative change in the size of each profile group varied somewhat. Specifically, the sample proportions of *victim (moderate)* and *victim-bully (moderate)* profiles decreased by 13% and 9%, respectively. Conversely, the sample proportions of the *not involved* and *victim-bully (high)* profiles increased by 27% and 115%, respectively. Because these changes were relatively symmetric relative to the distribution of bullying profiles, they did not result in a statistically significant change in mean bullying scores across the school year.

Classroom-level mixtures. The relative proportions of student-level bullying profiles by semester are plotted in Figure 3 for each classroom-level mixture. The two classroom-level mixtures contained 80.4% and 19.6% of the students, respectively, indicating that distinct classroom mixtures exist consistent with the present study's hypothesis. The larger mixture is labeled the *not involved and bullies* mixture (Mixture 1), and the smaller is labeled the *majority victim* mixture (Mixture 2). During fall semester, the *not involved and bullies* mixture consisted of a higher percentage of *not involved* profiles (31.0%) than the *majority victim* mixture (12.6%). The *not involved and bullies* mixture also consisted of a higher percentage of the two bully profiles (41.6%) than the *majority victim* mixture (22.4%). In contrast, the *majority victim* mixture consisted of a higher percentage of victim-only profiles (64.9%) than the *not involved and bullies* mixture (27.2%). Although the profile-level transition probabilities were constrained in the latent Markov model to be equal across mixtures, the differences in the composition of classroom mixtures during the fall semester yielded different rates of change in the proportions of each student-level profile over the academic year. For example, the relative proportion of the *victim (high)* profile increased by 45% in the *not involved and bullies* mixture but decreased slightly in the *majority victim* mixture. Conversely, the proportion of the *victim-bully (high)* profile decreased by 8% in the *not involved and bullies* mixture but increased almost by a factor of 10 in the *majority victim* mixture.

Interestingly, these differences cause the distributions of bullying profiles across classroom-level mixtures to become somewhat more homogeneous as the school year progresses. For example, the proportion of students in the two bullying states were 1.9 times larger in the *not involved and bullies* mixture than the *majority victim* mixture during the fall semester but only 1.5 times larger during the spring semes-

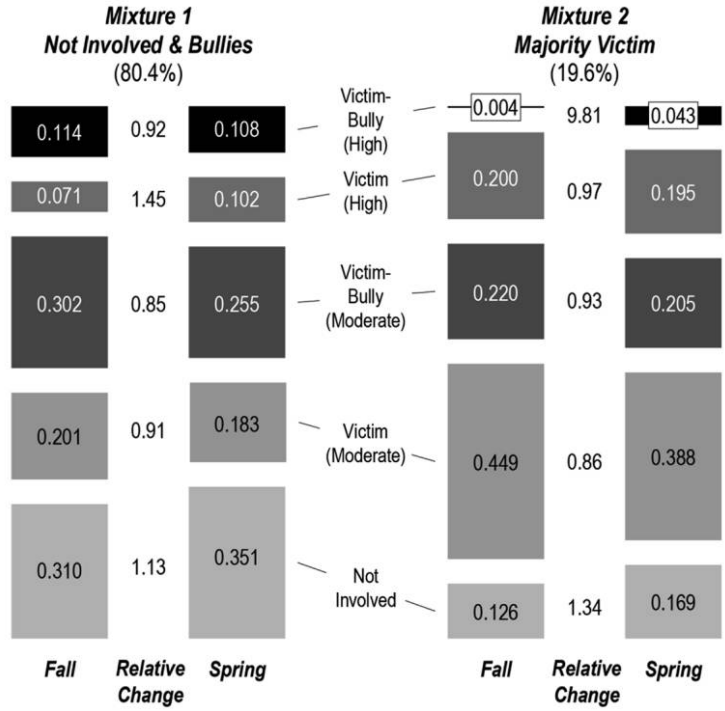

Figure 3. Multilevel latent Markov model student-level bullying profiles by classroom-level mixture and school semester.

ter. Conversely, the proportion of students in the two victim-only profiles were 2.4 times larger in the *majority victim* mixture than the *not involved and bullies* mixture during the fall semester, but only 2.1 times larger during the spring semester. Although these mixtures appeared to become more similar from fall to spring, differences between the two mixtures persisted over the course of the two waves.

Student-Level Profiles and Classroom-Level Mixtures by School

Student-level profiles and classroom-level mixtures are plotted for each school, respectively, in the top and bottom panels of Figure 4. Schools A and B were found to have higher proportions (A = 46%, B = 36%) of the student-level profile *not involved* than all other schools. Also, Schools A and B had lower proportions of *victim-bully (moderate)* profiles (A = 22%, B = 19%) and *victim-bully (high)* profiles (A = 8%, B = 6%) than several other schools. Alternatively, Schools C, D, and F had higher proportions of *victim-bully (moderate)* profiles: C = 32%, D = 33%, F = 31%. Also, School F had a higher proportion of *victim-bully (high)* profiles (15%) than several other schools. Finally, Schools A, E, and F had higher proportions of the classroom-level

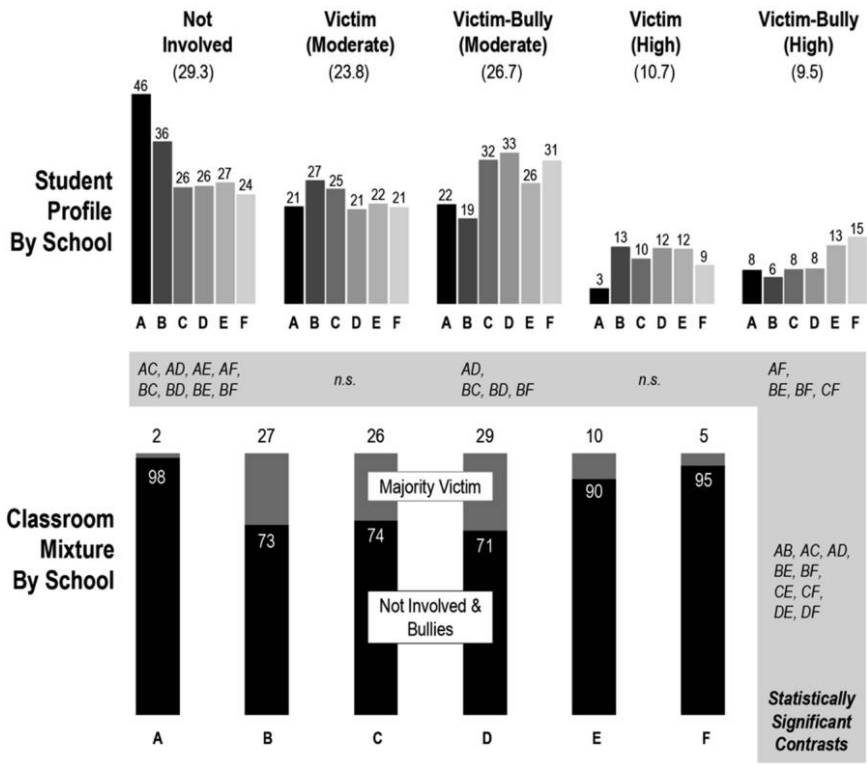

Figure 4. Multilevel latent Markov model student-level profiles and classroom mixtures by school. Numbers represent percentages of profiles and mixtures. Letters A, B, C, D, E, and F correspond to schools in the sample.

mixture *not involved and bullies* (A = 98%, E = 90%, F = 95%) and lower percentages of the *majority victims* classroom mixture (A = 2%, E = 10%, F = 5%) than other schools.

Discussion

The purpose of the present study was twofold: (a) to characterize student-level heterogeneity in bullying experiences and change in bullying experiences over the academic year by classifying students into bully/victim subgroups; and (b) to characterize how these child-level bullying experiences coalesce at the classroom and school levels. Based on prior work, we hypothesized that subgroups would represent the theoretically anticipated participant roles in bullying and that both the frequency of involvement and the form of the behavior would influence the classification of students into these subgroups. We also hypothesized that students would transition between these bullying subgroups over the course of the academic year.

Finally, we hypothesized that different constellations of these bully/victim subgroups would emerge representing distinct classroom-level profiles. Results revealed that a two-class, five-state model best fit the data. Student-level profiles will be discussed first, followed by a discussion of the classroom-level mixtures.

Student-Level Profiles

Five student-level profiles were identified: *not involved*, *victim (moderate)*, *victim (high)*, *victim-bully (moderate)*, and *victim-bully (high)*. The two victim-bully profiles were not only distinct based on the frequency of involvement (high vs. moderate) but also differed on form. The *victim-bully (moderate)* profile, although reporting similar levels of both forms of victimization, reported higher rates of relational bullying than overt bullying. However, the *victim-bully (high)* profile was characterized by high levels of both overt and relational victimization and bullying. These differences are similar to prior evidence where students highly involved in bullying as both perpetrators and victims represent a distinct group who often report greater acceptance of deviance and aggression and higher levels of engagement in more diverse types of aggressive behaviors (Camodeca, Goossens, Terwogt, & Schuengel, 2002; Marini et al., 2006). The two victim profiles, on the other hand, differed in frequency (high vs. moderate) but less so by form, with relational victimization slightly higher than overt victimization for both profiles. Prior evidence has noted that victims, especially chronic victims, are often targeted with multiple forms of bullying (e.g., Turner, Finkelhor, & Ormond, 2010); thus, it is not surprising that both victim profiles reported elevated levels of both overt and relational victimization. Of note, no distinct bullying profile emerged. In the present sample, those engaging in bullying also experienced some exposure to victimization. In one of the few prior studies on elementary school students, an aggressor-only class was found in fourth grade, but it disappeared by fifth grade (Williford et al., 2011). Some evidence among samples of middle and high school students suggest that students may not be identified as "pure" bullies and thus experience some victimization; likewise, "pure" victims may also be rare in that victims may also engage in some level of bullying (Rose, Simpson, & Moss, 2015), perhaps as a response to their victimization. These findings, along with results from the present study, suggest that children engaging in bullying may not be immune from victimization by classmates. However, further study is needed to confirm these latent profiles among larger samples, especially of elementary school students given the lack of evidence on this developmental age.

In examining changes in student-level profiles across the academic year, we found several interesting patterns. Consistent with prior evidence (e.g., Ryoo et al., 2015), the most stable profile from one semester to the next was the *not involved* profile (89%); however, roughly 10% moved into the *victim-bully (moderate)* profile. The least stable profiles were the *victim (high)* and *victim-bully (high)* profiles, where only about half of students remained in these profiles from fall to spring. Most children

moved from the *victim (high)* to *victim (moderate)* profiles from fall to spring, indicating a decline in exposure over the academic year. In contrast, the greatest number of children (22%) in the *victim-bully (high)* profile in the fall moved into the *victim (high)* profile, and another 11% moved into the *victim (moderate)* profile, suggesting that their aggressive behavior desisted over the year. It is possible, as noted earlier, that these students demonstrate more accepting attitudes toward deviance and aggression and thus, over time, their aggressive behavior becomes less tolerated by their classmates. Some evidence has also found that bully-victims experience higher levels of internalizing problems (e.g., depression and social anxiety) and greater peer rejection (Marini et al., 2006; Roland, 2002). These internalizing problems and peer relational difficulties have been identified as risk factors for peer victimization (Marini et al., 2006). It is possible that the aggressive behavior of some students in the present study's *victim-bully (high)* profile was distinguished by further peer rejection.

Two additional patterns are worth noting. First, approximately 18% of students in the *victim (moderate)* profile moved into the *victim (high)* profile, representing an increase in victimization exposure for these students over the academic year. These students may represent those at risk for more chronic victimization. The second pattern is that, although 64% of children in the *victim-bully (moderate)* subgroup remained in this profile, others moved to the two extremes, with 22% moving to *not involved* and 14% moving to *victim-bully (high)*. One possible reason for this difference may be the type of aggressive behavior that these children initially perpetrated in the fall. Not only do researchers commonly distinguish between the form of aggressive behavior, but distinctions have also been made on the functions of aggression (e.g., proactive and reactive). Although not assessed in the present study, these functions have been associated with different antecedents and consequences in prior studies. Reactive aggression is defined as aggression that occurs in angry defense to provocation (Little et al., 2003) and thus is considered an "impulsive, negatively valenced act" exhibited in response to a perceived or actual threat (Gendreau & Archer, 2005, p. 36). Conversely, proactive aggression is defined as aggression that is self-serving to achieve a particular social goal (Little et al., 2003). It also is associated with a social-learning model of aggression, which suggests that behavior is governed by positive or negative reinforcement (Vitaro & Brendgen, 2005). According to this perspective, proactive aggression is driven by anticipated rewards, such as getting attention, achieving a particular social goal, or attaining some object or resource (Gendreau & Archer, 2005; Little et al., 2003; Vitaro & Brendgen, 2005). It is possible that students in the present study who moved from the moderate to high victim-bully profiles may have reactively aggressed against peers, thus leading to increases in both bullying and victimization over time. Conversely, students who moved to the *not involved* profile may have engaged in proactive aggression. By spring, these students may not have continued to receive positive rewards from their behavior and thus desisted from exhibiting aggression. These possible explanations must be interpreted with

caution since these functions were not assessed in the present study. Nonetheless, future studies may benefit from using a multidimensional scale that measures both form and function to directly examine this possibility.

Classroom-Level Mixtures

Results also revealed two distinct classroom-level mixtures. Mixture 1 captures slightly over 80% of classrooms and is mostly characterized by students who are in the *not involved* and the high and moderate *victim-bully* profiles, whereas Mixture 2 represents roughly 20% of classrooms and is mostly characterized by students in the high and moderate *victim* profiles. Mixture 1 also contains a greater number of students categorized as highly aggressive and victimized, yet Mixture 2 includes a far greater number of victims than aggressors. This implies that there are fundamental differences in the composition of bully-victim subgroups across these two classroom mixtures.

In Mixture 2, it appears that a small number of highly aggressive students target a greater number of victims, whereas in Mixture 1, a larger portion of students engage in aggression but are also victimized. It is possible that in Mixture 1, students of fairly equal status target each other in more normative ways as students jockey for position within the peer group. Prior evidence has noted that students may use a number of strategies, including aggressive behavior, to establish their social status within the peer group hierarchy (see Rodkin & Gest, 2011), and thus, these displays may be viewed as more normative. In Mixture 2, however, it may be that a smaller number of highly and moderately aggressive students target a larger number of their peers, which may in turn represent more problematic peer relational styles or self-regulation challenges. Prior studies have noted that highly aggressive children, especially those who also experience peer victimization, report greater peer relational and emotion regulation problems (Marini et al., 2006; Roland, 2002). Of course, without further information these interpretations must be viewed cautiously, and further research is needed to determine what student-level characteristics may account for these kinds of distinctions at the classroom level. Also untested in the present study are specific teacher characteristics that have been found to influence students' involvement in bullying, such as teachers' attitudes toward bullying or their classroom management techniques (Allen, 2010; Williford, 2015). Future studies would benefit from larger samples of students, classrooms, and schools so more complex multilevel models could identify characteristics at each of these levels that structure the classroom ecology and thus may influence bully/victim subgroup membership.

It is important to note that bullying also takes place outside of the classroom in other school locations, such as the playground or lunchroom (Fite et al., 2013). Thus, differences across classrooms may also be due to factors outside of teacher or student characteristics. In fact, in the present study we found that the transition

probabilities from fall to spring did not vary across classroom-level mixtures. This finding suggests that classroom-level characteristics may not be a driving factor of why children transition to different states over time; rather, school characteristics may influence student-level changes over time. It is notable that school-level differences also emerged in the present study. Three of the participating schools contained a greater number of Mixture 2 classrooms than the other three schools. Important differences exist across these schools that were not accounted for in the current analyses. Based on data collected from focus groups with teachers and interviews with principals as a part of the larger project (see Williford, 2015), the schools with more Mixture 2 classrooms—which may represent more dysfunctional classroom ecologies—had principals who were either less supportive of efforts to improve their response to student bullying or who were viewed as less effective leaders by their teachers.

Notably, a number of school characteristics, such as student–teacher–principal relationships, have been shown to influence students' involvement in bullying (Espelage, Polanin, & Low, 2014; Goldweber et al., 2013). As such, considerable research in recent years has focused on school climate and identified factors that may increase or mitigate student bullying. For example, the interrelationships among students and between students and school personnel—important aspects of a school's climate—have been found to contribute to acts of perpetration and victimization among students (Astor, Guerra, & Van Acker, 2010). Thus, the broader social context in which bullying occurs must be considered. Accordingly, school climate has become a focus in school safety research (Bradshaw, Waasdorp, Debnam, & Johnson, 2014) and has been implicated as a critical marker of the success of preventive interventions aimed at reducing aggression and promoting safe schools (Astor et al., 2010). Future studies would benefit from explicitly modeling school-level characteristics, as well as student and teacher characteristics, to improve the field's understanding of the complex milieu of school and classroom ecologies. Such evidence may be particularly useful for refining bullying prevention and intervention efforts in schools.

Limitations

Several noteworthy limitations exist in the present study. First, study participants were from six elementary schools in one Midwestern school district that volunteered to participate in the project; thus, participating schools may have differed from other schools in the district that did not volunteer. These schools are also likely different from schools in other districts around the country, especially those in urban and rural areas where the student demographic make-up may include more or less racial/ethnic minority and low-income students. Second, because consent rates varied across schools, students whose parents consented to their participation may differ from those whose parents did not return consent forms or did not allow their

children to participate. Next, although youth have been found to be reliable reporters of negative behaviors (e.g., Rosenbaum, 2009), some participants may have answered in a socially desirable manner. Thus, collecting data on bullying and victimization involvement from multiple informants may be useful in future studies (see Cornell & Brockenbrough, 2004). Finally, the present study was limited in its ability to model time-varying variables across the two semesters. Bullying is a complex phenomenon where a number of individual and classroom characteristics may influence its maintenance over time. For example, a number of risk and protective factors—such as peer relationships, internalizing/externalizing difficulties, and relationships with teachers (see Craig & Pepler, 2003; Marini et al., 2006; Wang, Swearer, Lembeck, Collins, & Berry, 2015)—have been implicated in encouraging or mitigating bullying involvement over time. Future studies would benefit from more complex modeling techniques that account for some of these covariates in examining bullying involvement over time. Collectively, these limitations diminish our ability to generalize the results beyond the study's sample.

Implications for Prevention and Intervention

Despite these limitations, several notable implications for prevention and intervention in school settings exist. First, prevention and intervention efforts may benefit from this more nuanced understanding of student composition in bully-victim subgroups at the classroom level. Specifically, by understanding these student-level profiles within the classroom, teachers may benefit by being able to engage in specific classroom management activities that effectively target those involved in bullying. In fact, evidence suggests that teachers can take a more active role in influencing students' peer-group structures (Farmer et al., 2011; Gest & Rodkin, 2011) and thus can directly influence the composition of bully-victim subgroups, which in turn may improve classroom climate. In fact, in the present study, students moderately involved either as victims or victim-bullies made the most transitions from fall to spring, suggesting that students in the middle may be most receptive to preventive interventions. Thus, it is possible that targeted interventions in the classroom may be useful for influencing students moderately involved in bullying to transition into an uninvolved state. However, more intensive and individualized interventions may be needed to shift bullying involvement for students who are highly involved in these behaviors. In particular, school social workers are ideally positioned within the school environment to support students who are involved in bullying by providing intensive interventions to offset the potential negative outcomes that often result from bullying involvement. Supporting the social, emotional, and mental health of students is considered a key role of a school social worker (Franklin, Kim, & Tripodi, 2009). Additionally, school social workers are often tasked with providing professional development and capacity building within the school context (Kelly et al., 2010) and thus can effectively help teachers to manage their classrooms and support

students involved in these behaviors. As such, school social work practice may benefit from this nuanced understanding of bullying within the classoom setting.

Schools may also benefit from understanding not only student-level profiles but also classroom-level differences. By examining how classrooms may differ, schools can incorporate targeted prevention strategies that can have a direct effect on the overall school climate. For example, findings from the present study point to the potential influence of school climate on bullying involvement. First, differences in school climate specicially related to leadership characteristics were noted in prior qualitative work with the study's sample of schools. Second, the transition probabilities at the classroom level did not differ between the two classroom-level mixtures, suggesting that influences outside of the classroom may be stronger drivers of changes in student-level involvement over time.

In fact, conceptualizing school climate as a multidimensional construct with specific malleable features not only improves the field's understanding of the complex milieu in a school environment but also reveals targets for intervention that can enhance a school's functioning (Wang & Degol, 2016). Consistent with this multidimensional approach, the U.S. Department of Education (2009) developed a model of school climate consisting of three factors with several subdomains: safety (i.e., perceived safety, frequency of aggression and peer victimization), engagement (i.e., connection to teachers, student and school connectedness, academic engagement), and environment (i.e., rules and consequences for misbehavior). In prior research, this model has demonstrated adequate model fit, indicating the soundness of these three factors to describe and conceptualize school climate (Bradshaw et al., 2014). Developing intervention strategies based on this multidimensional model may help to improve the impact and precision of anti-bullying efforts in schools—a consequential direction for the field given the often modest impact of current antibullying prevention programs (Ttofi & Farrington, 2011), especially in the United States (Bradshaw, 2015). Studies, such as the present investigation, that use multilevel analytic methods are needed to identify intervention targets at the student, classroom, and school levels.

Conclusion

The present study extends the bullying and peer victimization literature by examining student-level heterogeneity in bullying experiences and change in bullying experiences over time and how these child-level bullying experiences coalesce at the classroom and school levels. Findings provide insights into the classroom ecology that may help to refine and improve the effectiveness of bullying and peer victimization prevention practices in schools. Furthermore, although these findings have clear implications for social work practice in schools, these results may have broader implications for the field of social work. As bullying and peer victimization often occur in other social ecologies (i.e., neighborhoods), understanding indi-

vidual and group-level changes in bullying behaviors is important for prevention and intervention efforts in other social-service systems where social work practitioners may interface with children and their families.

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